

# A-FRAME LEVEL

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## **INTRODUCTION**

The A-Frame Level is a simple, yet accurate tool used for constructing contours on a hillside or slope. It is useful in the basic construction of hillside farming systems, such as the SALT systems, as well as for establishing level contours and drainage ditches. Level contours on a slope reduce erosion, increase water infiltration, protect slopes and facilitate reclamation of degraded hillsides. The A-Frame Level can also be used to determine the percent slope of a hillside. This document provides the basic instructions for constructing and using an A-Frame Level.

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## **MATERIALS NEEDED FOR CONSTRUCTION**

- Two poles (wooden or bamboo) each 2 meters (6.6 feet) long
- One pole (wooden or bamboo) 1.2 meters (4 feet) long
- Nails, screws or 2 meters (6.6 feet) wire or strong cord for connecting the poles
- 1 meter (3.3 feet) of light cord or string
- Weight (rock, bottle etc)

## **ASSEMBLING THE A-FRAME**

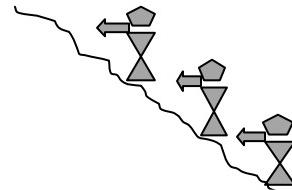
1. Connect the 2 longer poles together at one end, using the wire to lash them tightly or using the nails or screws. The poles can be notched at each end where they connect to prevent them from slipping
2. Connect the shorter pole across the middle of the longer poles to form a figure “A”.
  - a. The poles should be notched or lashed tightly so that they are attached securely.
  - b. If the distance between the legs at the base of the “A” is set at 1 meter, the A-Frame can be easily used for linear measurements and for calculating slope.
3. Tie one end of the light cord or string to the top of the “A” where the two longer poles are joined.
4. Tie the weight to the other end of the string so that it hangs about 15cm (6in) below the crossbar. The weight should hang freely and be sufficiently heavy.

## **CALIBRATING THE A-FRAME LEVEL**

1. Stand the A-Frame Level on solid ground (regardless how level).
2. Mark the spots where the legs are placed on the ground.
3. Let the weight settle to a natural position and make a temporary mark where the string crosses the cross bar.
4. Rotate the A-Frame 180 degrees so that the legs move to the opposite spot on the ground.
5. Once again, let the weight settle to a natural position and make a temporary mark where the string crosses the cross bar.
6. At exactly halfway between the 2 temporary marks make a permanent mark to indicate the “level” position.

## **MARKING CONTOUR LINES ON A SLOPE**

1. Start near the bottom of the slope, 1-1.5m (3.3-5ft) from the base.
2. Place the A-Frame at the edge of the field and mark the position of the leg of the A-Frame closest to the edge of the field using a stick, rock, etc.
3. Use this leg as a fixed pivot point and swing the second leg of the A-Frame in an arc along the surface of the field until the string lines up with the “level” position marked on the cross bar of the A-Frame. [Make sure to tilt the top of the A-Frame so that the weight hangs freely and the string is neither too close nor too far away from the crossbar.]
4. Once the level position is found, mark the position of the second leg.
5. Move the A-Frame onto this new pivot point.
6. Repeat the process across the slope digging or marking the contour line with sticks, rocks, etc.
7. From the completed contour line, face the hill and visually mark the spot for the next contour line by stretching out your arm as a sight. This should place the next contour line around 1.5m (5ft) vertical distance above the completed contour line.
8. Continue this process (steps 2-7) until you reach the top of the slope.
9. Contour lines can be smoothed out by aligning the points to follow the general curve.
10. Contour lines should now run across the slope 3-5m (10-16.5ft) apart, depending on the slope, with 1.5m (5ft) vertical distance between the contour lines.



*Mark the spot for the next contour line by stretching out your arm as a sight.*

## **MEASURING A SLOPE**

1. Measure the distance between the A-Frame legs.
2. Place the A-Frame perpendicular to the slope with one leg on the ground and the other going down-hill.
3. Raise the down-hill leg until the string lines up with the level position.
4. Measure the distance straight down from the bottom of the down-hill leg to the ground.
5. The distance to ground divided by the distance between legs will give the % slope.  
Example: 1m between legs, 10mm to ground =  $10\text{mm} / 1000\text{mm} = .01 = 1\%$  slope

## **INTERNET RESOURCES**

<http://www.pcarrd.dost.gov.ph/cin/AFIN/technologies%20-%20salt1.htm>  
[http://practicalaction.org/practicalanswers/product\\_info.php?cPath=24\\_79&products\\_id=63](http://practicalaction.org/practicalanswers/product_info.php?cPath=24_79&products_id=63)